In the Claims

1.   (Currently Amended) A method for processing an electromagnetic wave comprising the steps of:

receiving rectangular coordinate information for said electromagnetic wave; and

directly converting said rectangular coordinate information into a magnitude signal, a $\sin(\Phi)$, and a $\cos(\Phi)$ signal using a CORDIC algorithm employing shift and add/subtract operations, where Φ represents a phase of said electromagnetic wave.

2.   (Cancelled).

3.   (Currently Amended) A method as in claim [[2]] 1, wherein said shift and add/subtract operations are accomplished using a processor employing said CORDIC algorithm.

4.   (Cancelled).

5.   (Cancelled).

6.   (Cancelled).

7.   (Cancelled).

8.   (Currently Amended) A method as in claim [[7]] 1, wherein said step of direct converting includes a preprocessing stage that maps said rectangular coordinate information to a right hand plane of a coordinate map to avoid any phase ambiguity prior to said shift and add/subtract operations.

9.   (Original) A method as in claim 8, wherein said magnitude signal, said $\sin(\Phi)$ signal and said $\cos(\Phi)$ signal are generated in accordance with the equations:

$$\begin{bmatrix} X_{n+1} \\ Y_{n+1} \end{bmatrix} = \begin{bmatrix} 1 & \mu(n)2^{-n} \\ -\mu(n)2^{-n} & 1 \end{bmatrix} \begin{bmatrix} X_n \\ Y_n \end{bmatrix} \qquad \text{and}$$

$$\begin{bmatrix} C_{n+1} \\ S_{n+1} \end{bmatrix} = \begin{bmatrix} 1 & -\mu(n)2^{-n} \\ \mu(n)2^{-n} & 1 \end{bmatrix} \begin{bmatrix} C_n \\ S_n \end{bmatrix}$$

where the number of iterations, n, varies from 0 to $N-1$;

wherein X_0 is set to an in-phase component value of said electromagnetic wave, Y_0 is set to a quadrature component value of said electromagnetic wave, C_0 is set to a constant gain value K, S_0 is set to 0, and $\mu(n)$ is the sign of the electromagnetic wave and wherein said magnitude equals X_N multiplied by said constant value K and Y_N equals 0;

wherein X_0 is then set to said constant value K and Y_0 is set to 0; and

wherein said $\cos(\Phi)$ equals X_N multiplied by the sign of said in-phase component value and $\sin(\Phi)$ equals Y_N multiplied by the sign of said quadrature component value.

10.   (Currently Amended) An electromagnetic wave processor programmed to receive rectangular coordinate information for an electromagnetic wave, and to directly convert said rectangular coordinate information into a magnitude signal, a $\sin(\Phi)$, and a $\cos(\Phi)$ signal using a CORDIC algorithm employing shift and add/subtract operations, where Φ represents a phase of said input signal.

11.   (Cancelled).

12.   (Currently Amended) A processor as in claim [[11]] 10, wherein said processor is programmed to map said rectangular coordinate information to a right hand plane of a coordinate map to avoid any phase ambiguity prior to said shift and add/subtract operations.

13.   (Original) A processor as in claim 10, wherein said magnitude signal, said $\sin(\Phi)$ signal and said $\cos(\Phi)$ signal are generated in accordance with the equations:

$$\begin{bmatrix} X_{n+1} \\ Y_{n+1} \end{bmatrix} = \begin{bmatrix} 1 & \mu(n)2^{-n} \\ -\mu(n)2^{-n} & 1 \end{bmatrix} \begin{bmatrix} X_n \\ Y_n \end{bmatrix} \qquad \text{and}$$

$$\begin{bmatrix} C_{n+1} \\ S_{n+1} \end{bmatrix} = \begin{bmatrix} 1 & -\mu(n)2^{-n} \\ \mu(n)2^{-n} & 1 \end{bmatrix} \begin{bmatrix} C_n \\ S_n \end{bmatrix}$$

where the number of iterations, n, varies from 0 to $N-1$;

wherein X_0 is set to an in-phase component value of said electromagnetic wave, Y_0 is set to a quadrature component value of said electromagnetic wave, C_0 is set to a constant gain value K, S_0 is set to 0, and $\mu(n)$ is the sign of the electromagnetic wave and wherein said magnitude equals X_N multiplied by said constant value K and Y_N equals 0;

wherein X_0 is then set to said constant value K and Y_0 is set to 0; and

wherein said $\cos(\Phi)$ equals X_N multiplied by the sign of said in-phase component value and $\sin(\Phi)$ equals Y_N multiplied by the sign of said quadrature component value.

14.   (Cancelled).

15.   (Cancelled).

16.   (Currently Amended) A method for processing of an input wave comprising the steps of:

receiving quadrature information that represents said input wave when combined;

using a CORDIC algorithm employing shift and add/subtract operations to directly convert said quadrature information into a magnitude signal, a $\sin(\Phi)$, and a $\cos(\Phi)$ signal, where Φ represents a phase of said input signal;

generating at least one modified signal using at least one of said $\sin(\Phi)$ signal and/or said $\cos(\Phi)$ signal; and

regulating said modified signal using said magnitude signal to generate an output signal.

17.   (Cancelled).

18.   (Cancelled).

19.   (Cancelled).

20   (Currently Amended) A method as in claim [[19]] 16, wherein said step of direct

converting includes a preprocessing stage that maps said rectangular coordinate information to a

right hand plane of a coordinate map to avoid any phase ambiguity prior to said shift and

add/subtract operations.

21.   (Original) A method as in claim 16, wherein said step of regulating said modified signal

is performed using a plurality of segments.

22.   (Original) A method as in claim 21, wherein one or more of said segments is

independently controlled as a power amplifier to contribute power to an output signal.

23.   (Original) A method as in claim 22, wherein said power is contributed to said output

signal by using one or more selected from the group consisting of power transformers, quarter-

wave transmission lines, discrete LC components, and a Pi-networks.

24.   (Original) A method as in claim 21, wherein one or more of said segments is

independently controlled as a current source to contribute current to an output signal.

25.   (Currently Amended) An apparatus for processing of an input wave comprising the steps

of:

a processor programmed for receiving quadrature information that represents said input

wave when combined, and for using a CORDIC algorithm that uses shift and add/subtract

operations to directly convert said quadrature information into a magnitude signal, a $\sin(\Phi)$, and

a $\cos(\Phi)$ signal, where Φ represents a phase of said input signal;

a signal generator for generating at least one modified signal using at least one of said sin(Φ) signal and/or said cos(Φ) signal; and

an output signal generator for receiving said modified signal and using said magnitude signal to generate an output signal.

26. (Cancelled).

27. (Currently Amended) An apparatus as in claim [[26]] 25, wherein said processor is programmed to map said rectangular coordinate information to a right hand plane of a coordinate map to avoid any phase ambiguity prior to said shift and add/subtract operations.

28. (Original) An apparatus as in claim 25, wherein said magnitude signal, said sin(Φ) signal and said cos(Φ) signal are generated in accordance with the equations:

$$\begin{bmatrix} X_{n+1} \\ Y_{n+1} \end{bmatrix} = \begin{bmatrix} 1 & \mu(n)2^{-n} \\ -\mu(n)2^{-n} & 1 \end{bmatrix} \begin{bmatrix} X_n \\ Y_n \end{bmatrix} \qquad \text{and}$$

$$\begin{bmatrix} C_{n+1} \\ S_{n+1} \end{bmatrix} = \begin{bmatrix} 1 & -\mu(n)2^{-n} \\ \mu(n)2^{-n} & 1 \end{bmatrix} \begin{bmatrix} C_n \\ S_n \end{bmatrix}$$

where the number of iterations, n, varies from 0 to $N - 1$;

wherein X_0 is set to an in-phase component value of said electromagnetic wave, Y_0 is set to a quadrature component value of said electromagnetic wave, C_0 is set to a constant gain value K, S_0 is set to 0, and $\mu(n)$ is the sign of the electromagnetic wave and wherein said magnitude equals X_N multiplied by said constant value K and Y_N equals 0;

wherein X_0 is then set to said constant value K and Y_0 is set to 0; and

wherein said cos(Φ) equals X_N multiplied by the sign of said in-phase component value and sin(Φ) equals Y_N multiplied by the sign of said quadrature component value.

29.   (Cancelled).

30.   (Cancelled).

31.   (Original) An apparatus as in claim 25, wherein said output signal generator comprises plurality of segments.

32.   (Original) An apparatus as in claim 31, wherein one or more of said segments is independently controlled as a power amplifier to contribute power to an output signal.

33.   (Original) An apparatus as in claim 32, wherein said power is contributed to said output signal by using one or more selected from the group consisting of power transformers, quarter-wave transmission lines, discrete LC components, and a Pi-networks.

34.   (Original) An apparatus as in claim 31, wherein one or more of said segments is independently controlled as a current source to contribute current to an output signal.